GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[x] ORIGINAL [ ] REVISION NO. _____

Project No. X-20-802 GTRI/~~GIT~~ DATE 6/7/84

Project Director: Steve McCamy School/~~Lab~~ Continuing Education

Sponsor: National Science Foundation

Type Agreement: Grant No. ATM-8320432

Award Period: From 5/1/84 To ~~10/31/85~~ ~~11-30-86~~ (Performance) 1/31/86 * (Reports)

Sponsor Amount:	This Change 11/30/87	Total to Date
Estimated: $		$
Funded: $	44,900	$ 44,900

Cost Sharing Amount: $ N/A Cost Sharing No: _____

Title: "Development of a Short Course Program on Career Options in Atmospheric and Geophysical Sciences"

ADMINISTRATIVE DATA OCA Contact Lynn Boyd x4820

1) Sponsor Technical Contact:

~~Jay S. Fein~~ Pamela L. Stephens AAEO/ATM
National Science Foundation
Washington, DC 20550

(202) 357-9602

2) Sponsor Admin/Contractual Matters:

~~Mary Frances O'Connell~~ Lee A. DeHerrara DGC/AAEO
Grants Official
National Science Foundation
Washington, DC 20550

(202) 357-9602

Defense Priority Rating: n/a Military Security Classification: n/a

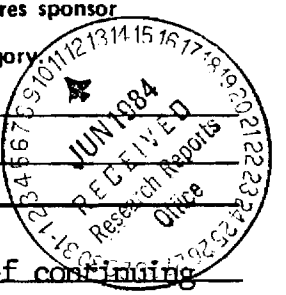
(or) Company/Industrial Proprietary: n/a

RESTRICTIONS

See Attached NSF Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval – Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with GIT.



COMMENTS:

* Includes usual 6-month unfunded flexibility period. 1st year of continuing award.

Copy of all initiation paperwork to Geophysical Sciences as subprojects will be set up at a later time under the direction of Drs. Carl G. Justus; John H. Hall,Jr.; and Leland L. Long

COPIES TO:

Project Director
Research Administrative Network
Research Property Management
Accounting

Procurement/EES Supply Services
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GTRI
Library
Project File
Other Newton, Hall, Justus, Long, Cook

FORM OCA 4-79

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date 1/27/88

Project No. X-20-802 School/~~Dept~~ Continuing Ed

Includes Subproject No.(s) G-35-804 / Justus

Project Director(s) D. Kyser GTRC / ~~GIT~~

Sponsor NSF

Title Development of a Short Course Program on Career Options in Atmospheric and Geophysical Sciences

Effective Completion Date: 11/30/87 (Performance) 11/30/87 (Reports)

Grant/Contract Closeout Actions Remaining:

- [X] None
- [ ] Final Invoice or Final Fiscal Report
- [ ] Closing Documents
- [ ] Final Report of Inventions
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] Other

Continues Project No. Continued by Project No.

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Library
GTRC
Research Communications (2)
Project File
Other Duane Hutchison
Angela DuBose
Russ Embry

REQUIRED MATERIAL FOR RENEWAL OF

DEVELOPMENT OF A SHORT COURSE PROGRAM ON CAREER OPTIONS IN ATMOSPHERIC AND GEOPHYSICAL SCIENCES

School of Geophysical Sciences
Georgia Institute of Technology
Atlanta, GA 30332

C.G. Justus, Principal Investigator

J.H. Hall, L.T. Long, Co-P.I.'s

NSF Grant No. ATM-8320432

1. REPORT OF PROGRESS

Two very successful short courses have been held. The first, on "Introduction to Problems of Acid Rain" was held November 7-9, 1984. There were 144 applicants for attendance with travel reimbursement or a no-fee basis (an option offered to all university faculty, staff and students). A total of 120 attended, including 11 fee-paying participants from government agencies and private industry. A summary of the evaluation responses received from 41 attendees is attached. The second short course, "Remote Sensing of the Earth and Atmosphere" was held May 13-14, 1985. There were 57 applicants for attendance with travel reimbursement or a no-fee basis. A total of 56 attended, including two fee-paying participants from government agencies. A summary of the evaluation responses from 22 attendees is attached.

2. PLANS FOR NEXT YEAR

A short course entitled "Atmosphere/Biosphere Interactions" is planned for May 22-23, 1986. A draft copy of the brochure is attached. An additional short course, topic to be determined, will be offered in the Fall quarter of 1986.

3. PROJECT PERSONNEL

No changes.

4. PUBLICATIONS

Copies of the brochures for the short course "Introduction to Problems of Acid Rain," November 7-9, 1984, and "Remote Sensing of the Earth and Atmosphere," May 13-14, 1985, are attached.

5. OTHER FUNDING SUPPORT

A summary of P.I. and Co-P.I. Funding Support is attached.

6. BUDGET FOR NEXT YEAR

NSF One-Page summary form is attached.

7. ESTIMATE OF GRANT FUNDS UNSPENT

No residual funds are expected as of 5/31/86.

INTRODUCTION TO PROBLEMS OF ACID RAIN

Georgia Institute of Technology
School of Geophysical Sciences and Department of Continuing Education

GENERAL EVALUATION

(from 41 Review Forms Received)

1. Do you feel that the objective of this course was met?

   YES 98% NO 2%

2. Supervision and planning of the course:

   EXCELLENT 37% GOOD 58% FAIR 5% POOR None

3. Overall Instruction:

   EXCELLENT 75% GOOD 20% FAIR 5% POOR None

4. Physical Facilities:

   EXCELLENT 45% GOOD 50% FAIR 5% POOR None

5. Was the material generally presented at the correct level for the group?

   YES 92% NO 8%

6. Would you recommend that your organization send other people to a short course of this kind in the future?

   YES 97% NO 3%

REMOTE SENSING OF THE EARTH AND ATMOSHERE

Georgia Institute of Technology
School of Geophysical Sciences
and
Department of Continuing Education

GENERAL EVALUATION

(from 22 Review Forms Received)

1. Was the objective of this course met?

YES 95% NO 5%

2. Supervision and planning of the course:

EXCELLENT 52% GOOD 38% FAIR 10% POOR NONE

3. Overall Instruction:

EXCELLENT 43% GOOD 57% FAIR NONE POOR NONE

4. Physical Facilities:

EXCELLENT 62% GOOD 33% FAIR 5% POOR NONE

5. Was the material generally presented at the correct level?

YES 90% NO 10%

6. Would you recommend that your organization send other people to a short course of this kind in the future?

YES 95% NO 5%

BROCHURE DRAFT

Atmosphere/Biosphere Interactions

Atlanta, GA
May 22 & 23 1986

Atmosphere/Biosphere Interactions

Sponsorship

This short course is jointly sponsored by the National Science Foundation, the Atlanta University Center, and the Department of Continuing Education and the School of Geophysical Sciences of the Georgia Institute of Technology.

Background

Awareness is increasing concerning the fragile nature of our biosphere and its ecosystems. Many of the known or suspected environmental impacts are related to processes of atmospheric transport, chemical transformations and atmospheric deposition. In many areas of the country, especially the Northeast, acid rain is considered to be a major cause of damage observed in lakes and forests. Southern latitudes, with high levels of summer solar radiation, favor production of ozone from its photochemical-pollutant precursors. The relative roles of atmospheric deposition of oxidants, acidic compounds and other toxic pollutants is not completely understood. Yet damage effects are being identified and documented in what seems to be a growing portion of our non-industrial, non-urban environment.

This short course will survey the status of current programs to document the causes and effects of atmospheric processes on the ecology of our region. It will also examine the economic and policy impacts which must be addressed in dealing with these issues, and outline some programs of research which are being undertaken to address remaining questions and problem areas. The possible advantages to developing a "Southern Strategy" for looking at environmental processes which are unique to the region will also be examined.

Objective

This is one of a continuing series of short courses being offered under a three-year program, funded by the National Science Foundation, for the purpose of offering career options in the atmospheric and geophysical sciences. This program is an outgrowth of the National Science Foundation-funded Graduate Research Opportunities in Atmospheric and Terrestrial Sciences program at Georgia Tech and is one element of a multi-faceted program for development of career

options in atmospheric and geophysical sciences. A strong interactive program has already been developed between the Georgia Institute of Technology, the Atlanta University Center (AUC), its member colleges, and Jackson State University in Mississippi. Program elements include an undergraduate program in geophysical sciences (AUC), a summer traineeship program for undergraduates (Ga Tech/AUC), community outreach activities (AUC Resource Center for Science and Engineering), a Graduate Research component (Ga Tech,) and joint research projects (Ga Tech/AUC/Jackson State). This series of short courses in various aspects of atmospheric science, geochemistry and geophysics is designed to allow interaction between faculty and researchers at Ga Tech and AUC with the faculty and students of regional 4-year colleges. Objectives of the short course program are: to keep the regional college faculty abreast of various current research interests, latest research techniques, and applications for the basic sciences toward research problems in atmospheric and geophysical science areas; to serve as a mechanism for establishing joint research and other interaction between Ga Tech/AUC and regional college faculty and students; and to serve as a mechanism for attracting undergraduate students into the summer traineeship and/or graduate research elements of the overall program.

Who Should Attend

The course is designed to serve as an introduction to the subject area for science faculty of 4-year colleges who serve as advisors for students who may participate in the summer traineeship and/or graduate research programs at Ga Tech and AUC, as well as their students who may be interested in such participation. National Science Foundation funds are available to provide reimbursement for transportation and lodging expenses for a limited number of faculty and student attendees. If registration exceeds the limits of these funds, attendance at no charge for academic faculty and students will be provided, up to the limits which can be accomodated. On a space-available basis, persons from industry or government agencies may also attend, with a registration fee of $100 charged.

Outline

Day 1

Overview of Ecology and Atmosphere/Biosphere Interactions

Environmental Impacts of Ozone and Toxic Pollutants

Current Status of Environmental Effects on Forests

Environmental Effects on Forest Insect Infestations

The Georgia Tech Atmospheric Chemistry Field Measurement Program

Environmental Effects at Mount Mitchell, North Carolina

"Get-Acquainted" Reception

Day 2

Economic Impacts of Atmospheric Deposition on Forests

Policy Developments and Environmental Issues

Research Programs and Strategies

A "Southern Strategy" for Environmental Assessment

Panel Discussion by Participants

Wrap-Up Discussion and Plans for Future Interactions

Faculty

Mr. Robert H. Collom
Chief, Air Protection Branch
Georgia Environmental Protection Division

Mr. Collom heads the program in the State of Georgia which is responsible for the achievement and maintanance of all Federal and State air quality regulations. Mr. Collom will address impacts of ozone and other toxic pollutants in Georgia and the Southeast region.

Dr. Douglas D. Davis
Professor
Georgia Tech School of Geophysical Sciences

Dr. Davis heads an atmospheric chemistry program at Georgia Tech which is developing and applying advanced laser techniques to the detection and analysis of extremely low-level trace constituents in natural and polluted environments. Dr. Davis's group is currently installing, testing and operating an atmospheric chemistry monitoring station on top of Stone Mountain. Particular areas of study are the photochemistry processes affecting the formation of oxidants and acid rain precursors.

Dr. Ed DeSteiguer
Project Leader and Economist
USDA Forest Service

Dr. DeSteiguer leads a USDA project investigating the methods of assessing the effects and economic impacts of acid rain effects on forests. He also has examined the economic impacts of the Southern Pine Beetle and Atmospheric Deposition on Southern Forests.

Dr. E. Lloyd Dunn
Associate Professor
Georgia Tech School of Applied Biology

Dr. Dunn's areas of interest include physiological ecology, primary productivity of marshland areas, and various aspects of the biogeochemical cycles, including the carbon cycle and the sulfur cycle.

Dr. John Hall
Senior Research Scientist
Georgia Tech School of Geophysical Sciences

In addition to his research appointment at Georgia Tech, Dr. Hall is also on the faculty of the Chemistry Department of Morehouse College at AUC and heads the undergraduate program in Atmospheric Science and Geophysics at AUC. His specialty is matrix isolation techniques for measurement and analysis of trace species.

Dr. C. G. Justus
Professor
Georgia Tech School of Geophysical Sciences

Dr. Justus is conducting research for NOAA on vegetation index analysis, a product which provides essentially real-time, satellite estimates of the state and vigor of vegetation on a global scale.

Dr. C. S. Kiang
Director
Georgia Tech School of Geophysical Sciences

Dr. Kiang is Co-Chairman of the Southern Commercial Forests Steering Committee, and Chairman of the Acid Deposition Subcommittee of the Task Force, organized by The Institute for Technology Development to study environmental impacts on the productivity of Southern Commercial Forests.

Dr. James E. Kundell
Scientist and Technical Associate
University of Georgia, Carl Vincent Institute of Government

Dr. Kundell serves as Science Adviser to the Georgia General Assembly. He is also Chairman of the Science Technology and Resource Planning Committee of the National Conference of State Legislators. Dr. Kundell will address the policy aspects of environental impacts.

Mr. John Mixon
Director, Georgia Forestry Commission

Mr. Mixon, as director of the Georgia Forestry Commission, will provide a survey of the present situation of Georgia's forests with respect to acid deposition and other environmental factors.

Dr. Evan Nebeker
Entomology Department
Mississippi Agricultur and Forestry Experiment Station

Dr. Nebeker's area of expertise is Southern Forest Ecosystems, atmospheric depostion on host plants, forest insects and insect populations.

Dr. James Perkins
Vice President for Research and Development
Institute for Technology Development

The Institute for Technology Development has initiated a Task Force to study problems of maintaining productivity in the Southern Commercial Forests. Dr. Perkins will provide an overview of the Institute's program and outline the strategies being developed for addressing atmospheric deposition and other environmental problems.

Dr. Luther Roland
Research Scientist
Georgia Tech School of Geophysical Sciences

Dr. Roland heads the summer traineeship program at Georgia Tech/AUC. His area of specialty is in gas-chromatograph mass-spectrometric analysis of trace constituents in aqeous media.

Dr. V. K. Saxena
Associate Professor
North Carolina State University, Department of Marine, Earth and Atmospheric Sciences

Dr. Saxena is part of an EPA-sponsored research project investigating the environmental impacts on Mount Mitchell, North Carolina. His interests include the interactions of ozone and acid deposition on forest ecosystems.

Registration and Application for Travel Stipend

Use same material as for previous short course on REMOTE SENSING, except changing to "Get Acquainted" reception on May 22, instead of dinner as before

Be sure to include address of Continuing Education.

Be sure to note that two lunches will be provided at no cost, but that reimbursement for other meals will not be provided.

Deadline for receipt of applications for travel reimbursement should be no later than April 7.

Housing, Meals and Parking

P.I. and CO-P.I. FUNDING SUPPORT

Investigator	Agency	Title	Amount	Month	Period
Justus	DOE	Satellite Techniques of Solar Resource Assessment for Focusing and Non-Focusing Solar Collector Systems	$38K	0	7/85-12/85
Justus	NASA	Improvements in the Global Reference Atmospheric Model	$50K	1	9/85-12/85
Justus	NOAA	Satellite Data, Model and Ground-Truth Studies at Visible, Near-IR and Reflective-FR Wavelengths	$50K	1	12/84-2/86
Hall	NSF	Developing Graduate Research in Earth and Atmospheric Sciences	$409K	6	2/84-9/86
Long	Law Engr.	Potential Data Acquisition and Analysis	$31K	1	7/85-11/87
Long	NRC	Georgia/Alabama Regional Seismographic Network	$100K	1	8/85-7/88

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

FINAL PROJECT REPORT
NSF FORM 98A

PLEASE READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING

PART I–PROJECT IDENTIFICATION INFORMATION

1. Institution and Address	2. NSF Program	3. NSF Award Number
Geophysical Sciences Georgia Tech Atlanta, GA 30332	Atmospheric Sciences	ATM-8320432
	4. Award Period From 5/1/84 To 11/30/87	5. Cumulative Award Amount $148,400

6. Project Title: Development of a Short Course Program on Career Options in Atmospheric and Geophysical Sciences

PART II–SUMMARY OF COMPLETED PROJECT *(FOR PUBLIC USE)*

The purpose of this short course program was to offer career options in the atmospheric and geophysical sciences. This program was an outgrowth of the National Science Foundation-funded Graduate Research Opportunities in Atmospheric and Terrestrial Sciences program at Georgia Tech and was one element of a multi-faceted program for development of career options in atmospheric and geophysical sciences. A strong interactive program has been developed between the Georgia Institute of Technology, the Atlanta University Center (AUC), its member colleges, and Jackson State University in Mississippi. Program elements include an undergraduate program in geophysical sciences (AUC), a summer traineeship program for undergraduates (Georgia Tech/AUC), community outreach activities (AUC Resource Center for Science Engineering), a Graduate Research component (Georgia Tech), and joint research projects (Georgia Tech/AUC/Jackson State). This series of short courses in various aspects of atmospheric science, geochemistry and geophysics was designed to allow interaction between faculty and researchers at Georgia Tech and AUC with the faculty and students of regional 4-year colleges. Objectives of the short course program were: to keep the regional college faculty abreast of various current research interests, latest research techniques, and applications for the basic sciences toward research problems in atmospheric and geophysical science areas; to serve as a mechanism for establishing joint research and other interaction between Georgia Tech/AUC and regional college faculty and students; and to serve as a mechanism for attracting undergraduate students into the summer traineeship and/or graduate research elements of the overall program. Short courses in four areas were offered: Introduction to Problems of Acid Rain, Remote Sensing of the Earth and Atmosphere, Atmosphere/Biosphere Interactions, and Environmental Aspects of Toxic Waste Disposal.

PART III–TECHNICAL INFORMATION *(FOR PROGRAM MANAGEMENT USES)*

1. ITEM *(Check appropriate blocks)*	NONE	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
				Check (✓)	Approx. Date
a. Abstracts of Theses	X				
b. Publication Citations	X				
c. Data on Scientific Collaborators	X				
d. Information on Inventions	X				
e. Technical Description of Project and Results		X			
f. Other *(specify)*					

2. Principal Investigator/Project Director Name *(Typed)*	3 [illegible] nature	4. Date
C. G. Justus		1/5/88

NSF Form 98A (5-78) Supersedes All Previous Editions

Form Approved OMB No. 99R0013

DESCRIPTION OF PROJECT AND RESULTS

The purpose of this short course program was to offer career options in the atmospheric and geophysical sciences. This program was an outgrowth of the National Science Foundation-funded Graduate Research Opportunities in Atmospheric and Terrestrial Sciences program at Georgia Tech and was one element of a multi-faceted program for development of career options in atmospheric and geophysical sciences.

A strong interactive program has been developed between the Georgia Institute of Technology, the Atlanta University Center (AUC), its member colleges, and Jackson State University in Mississippi. Program elements include an undergraduate program in geophysical sciences (AUC), a summer traineeship program for undergraduates (Georgia Tech/AUC), community outreach activities (AUC Resource Center for Science and Engineering), a Graduate Research component (Georgia Tech), and joint research projects (Georgia Tech/AUC/Jackson State). This series of short courses in various aspects of atmospheric science, geochemistry and geophysics was designed to allow interaction between faculty and researchers at Georgia Tech and AUC with the faculty and students of regional 4-year colleges.

Objectives of the short course program were: to keep the regional college faculty abreast of various current research interests, latest research techniques, and applications for the basic sciences toward research problems in atmospheric and geophysical science areas; to serve as a mechanism for establishing joint research and other interaction between Georgia Tech/AUC and regional college faculty and students; and to serve as a mechanism for attracting undergraduate students into the summer traineeship and/or graduate research elements of the overall program.

Short courses in four areas were offered:

- Introduction to Problems of Acid Rain
- Remote Sensing of the Earth and Atmosphere
- Atmosphere/Biosphere Interactions
- Environmental Aspects of Toxic Waste Disposal

Results summarized from the follow-up questionnaire are attached. Of the total of 55 attendee responses, 47 were from faculty members (answering questions 3-8) and 6 were from students (answering questions 9-13).

SUMMARY RESULTS OF THE
FOLLOWUP QUESTIONNAIRE FOR NATIONAL SCIENCE FOUNDATION/
GEORGIA TECH SHORT COURSE PROGRAM

1. Which of the following short courses did you attend?

   a. Introduction to Problems of Acid Rain 27

   b. Remote Sensing of the Earth and Atmosphere 12

   c. Atmosphere/Biosphere Interactions 12

   d. Environmental Aspects of Toxic Waste Disposal 26

2. If you attended more than one short course, which did you find most useful (check one, as denoted in question #1)?

   a. 7 b. 2 c. ____ d. 2

QUESTIONS 3-8 WERE COMPLETED BY UNIVERSITY FACULTY ATTENDEES ONLY.

3. Did you find the short courses of any benefit in the teaching of your academic courses? 46 Yes 4 No

   If so, how? Which courses?

   Physical Science, I was able to appreciate the magnitude acid rain is becoming.
   Acid rain is a topic in one of our courses.
   Environment & Man.
   Environmental Chemistry and Theoretical Chemistry.
   Environmental Chemistry, because the environmental aspects of the pollution are the main concern of this course.
   Course taught me the significance and the adequate procedures for toxic waste disposal.
   Biology Senior Seminar, 1985; the focus was on acid rain & associated biological events.
   I team teach a course entitled "Energy and the Environment", an interdisciplinary offering examining the scientific, environmental, political, and ethical questions of the energy problem.
   It gave me up-to-date information to use in a survey course offered for nonscience majors.
   It gave me reference material to use in my freshman chemistry course.
   I was exposed to new concepts in remote sensing which I now include in courses on physical geography and climatology.
   I was able to use some of the information in my introductory courses and many of the references in my upper level courses.

Helped me set up an acid rain conference.
The materials were useful in General Chemistry where pollutants are discussed as well as in seminars on current topics of a chemical nature.
Ecology: recent research-techniques and results in Topic C for Biology majors.
Environmental Science: assurance that citizens' concerns seem legitimate and worth sustained scientific study.
Special Problems, independent study courses for undergraduate and graduate Environmental Health majors.
I was able to introduce some of the material into a course in Ecology.
I used some of the material in my biology courses.
General Chemistry.
Aquatic Toxicology and Hazard Assessment.
Ecology on Reelfoot Lake, an interdisciplinary course for high school teachers.
Handout materials, up-to-date references useful to courses dealing with air pollution and/or atmospheric transport.
Environmental Awareness, background for interpreting remote sensing information.
Fundamentals of Chemistry for the non-science majors.
Very current updating of new research data into a series of lectures on acid depositories & hazardous waste issues.
Environmental Toxicology.
Introduction to Environmental Science.
Freshman Analytical and Physical Chemistry.
General Chemistry.
Air Pollution, Environmental and Industrial Toxicology.
Environmental Program Planning and Law.
Earth Science.
Research Course.
General Chemistry & Consumer Chemistry.
Environmental Aspects of Toxic Waste Disposal.
Freshman General Biology.
Physical Science.
Natural Science.
General Chemistry courses.
Meteorology.
It is always helpful to increase knowledge of areas of study for applications of mathematics.
Improved my understanding of various aspects of the topic and provided newinformation which makes me somewhat more knowledgeable, therefore, presumably my teaching is expanded.
Physical Science.
General Chemistry.
Provided more detail which was used in writing proposals and discussion inthe classroom.
Both (a) and (b) were useful.
The "Acid Rain" course was helpful in teaching Environmental Science I, and the "Remote Sensing" course encouraged me to add a course (ESC 350-Remote Sensing) to our Earth Science curriculum.
Use examples in my lectures.
I can better relate the wide spread ramifications of acid rain beyond just the topic at hand.
Physical Science III.

4. Did you introduce any new courses into the curriculum of your school/ department as a result of the short course program? 3 Yes 41 No

   If so, what course(s)?

   Conference.
   Physical Geography.
   Remote sensing.
   ESC 350-Remote Sensing.

5. Did any of your students apply for the summer traineeship program at Georgia Tech/Atlanta University Center? 6 Yes 41 No

   If so, which students?

   Wendell Pickens
   Vivian Brown
   Johnny Reynolds
   Eddie Lenz
   1 went for undergraduate research
   Vaughn Jelks (not accepted)
   Jiniang May

6. Did any of your students go to graduate school in the Earth or Atmospheric Sciences after completion of their undergraduate degree? 6 Yes 41 No

   If so, which students, which degree program, and what University?

   Mark Castro, Ph.D., University of Virginia
   Norm Goulet, Ph.D., Virginia Polytechnic Institute
   Patrick Gagen received M.S. degree in Geology from Virginia Tech University in June 1987
   Takmeng Wong, Colorado State University Atmospheric Science
   Steve Lazarus, University of Oklahoma, Meteorology
   1 undergraduate student left LSU to pursue a degree in meteorology
   Miles Workman, M.S. Geology, University of Georgia
   Donald Belk, M.A. Geography, East Carolina University
   Glenda Gosnell, M.S. Geology, Auburn University
   Eric Pyle, M.S. Geology, Emory University
   Chris Leeth, M.S. Geology, Georgia State
   Alan Yarbrough, Geo Sciences, Georgia Tech

7. Did the short course program benefit your research program in any way?

   18 Yes 29 No

If so, how?

It showed us better methods of analysis and data collection.
By helping to clarify the atmosphere chemistry associated with acid rain.
It gave ideas on new methods and new directions to take and it gave information on equipment sources.
I have found remote sensing of the atmosphere as a help in interpreting synoptic weather types and moisture flow.
Information gained in short courses A & C helped in preparation of a proposal to look at atmospheric deposition effects on forests.
The course made me more aware of the funding opportunities in toxic waste disposed.
We are only a teaching institution.
I showed results of course with colleagues in Earth-Science and Chemistry.
To a certain degree.
The contents of this course pointed out some specific hazardous chemicals which may be used in determining toxicity to selected invertebraes.
Provided introduction to a new field of research.
I am doing research on acid precipitation (rain and dew), using ion chromatography.
Encouraged us to set up a lab.
We did a short project in monitoring acid deposition with Mr. Jelks; following his work we still have 1 or 2 students interested in the same project.
I believe it will be useful in future research.
It increased by breadth of knowledge.
Provided an awareness of the scope of research activities in mathematics in this area of study.
I have submitted two research grants.
The short course and the Summer Internship at EPA got me interested in Environmental related research.
Planning to write proposals for EPA funding.

8. Did you apply for and/or receive research grants relating to short course topic areas? 8 Yes 41 No

If so, what topic?

Analysis of effect of acid rain on catfish raising ponds.
Analysis of anion content of acid rain.
Study of trace metal pollutants in aqueous sediment, soil and plant samples.
TOPS-Acid Rain Conference.
Have submitted a proposal to NSF.
Acid rain.
Acid precipitation, one summer research grant.
Image processing relative to infrared sensors.
Biodegradation pollutant.

QUESTIONS 9-13 WERE COMPLETED BY STUDENT ATTENDEES ONLY

9. Did you find the short course program of any benefit in your undergraduate academic program? __4__ Yes __2__ No

   If so, in what way?

   I was able in Ecology to deal more intelligently with the topic of acid rain in the natural environment.
   I was able to incorporate some of the learned material in my courses in general biology.
   Not directly blending with marine chemistry...but I did find it highly enlightening & broadening especially relating the perspectives of a wide variety of speakers.
   I have proposed to the University Curriculum Committee for offering a course on Toxic Waste Disposal.

10. Did you apply for the summer traineeship program at Georgia Tech/Atlanta University Center? __1__ Yes __5__ No

11. Are you still in undergraduate school? __1__ Yes __3__ No

12. Did you apply for graduate school in the Earth or Atmospheric Sciences area? __1__ Yes __2__ No

    If so, which university?

    Before courses, USF in Marine Science;

13. If you have finished school and are working, did you get a job in a field related to the Earth or Atmospheric Sciences? __1__ Yes __1__ No

    If so, what field.

    Not directly, I wrote an article based largely on material from the short course.